ISSN 1563-2415

Статистика, учет и аудит, 4(84)2022 стр. 39 - 47

ГРНТИ 06.51.02
УДК 338
https://doi.org/10.51579/1563-2415.2022-1.01

THE EFFECT OF TEACHING INNOVATION ON LEARNING EFFECTIVENESS AMONG THE STUDENTS OF INDUSTRIAL DESIGN IN HIGHER EDUCATION

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Abstract: *This article discusses the effect of teaching innovation in Industrial Design education, it is needed to reinvent about everything to override challenge of public consciousness. Teaching innovation is including scientific advances, technology breakthroughs, new political, economic structures, environmental solutions, or an updated code of ethics for nowadays life. Everything demands innovative, out of box thinking is a must in teaching and learning. The challenge today for Industrial Design education is how to capture the students' attention, and putting across ideas in such a way that it stays with them long after they have left the classroom. This means that Industrial Design lecturers need a set of teaching innovation which influence innovative development. In this manner, the content explores to assimilate the elements, ideas and methods that consider as teaching innovation on learning effectiveness. The objectives of this article are to identify the effect of teaching innovation methods for an Industrial Design programme and to explore how processes of teaching innovation on learning effectiveness in Industrial Design programme. This article compiles secondary data on a topic by accredited scholars and researchers; critically reviews existing research on the topic; and analyses contrasting perspectives and theoretical approaches. In summary, this paper consolidates the concept of teaching innovation in Industrial Design education and the learning effectiveness among the Industrial Design students in higher education setting.*

Keywords: *Industrial Design Education, Teaching Innovation, Higher Education, Learning Effectiveness*

Main provisions of the article. The topics discussed above focus mainly on the literature definition and an overview of Industrial Design teaching innovation, including strategies and ideas. It is important to have a full understanding of each topic and the relation between them. The objectives of research were achieved based on these findings. It is hoped that this research can help Industrial Design lecturers conduct the Industrial Design courses and improve the student learning effectiveness in higher education.

Introduction. Nowadays, the online and open education world is changing how education is delivered. Digital technologies are developing educational activities as well [1]; [2]. Within different level of education, innovative technologies have enormous potential to effect change of teaching method [3]. The education landscape is undergoing significant change as a result of teaching innovations. Lecturers and students are witnessing changes in the way higher education is taught and in the way students learn. Recent technologies and approaches

to education are already having a clear and positive impact on higher education in 21st century [4].

Many lecturers found out that inflexible timetables to be too rigid, have solved this via eliminating conventional classes altogether. With the assist of technology, design classes must not adhere to the constant layout approach characteristic of the conventional device. ID students stand to benefit lots from extra personalized design training and more mange over their own mastering skill, including hands on skill and software skill. The ramifications for lecturers are energizing, they become allowed to take on various jobs, including tutor, mentor and creator of activities that this present reality significance of subject material [5]. In reality, innovation and the present-day classroom version most customarily perform as antagonist. The device is evolving but not enough to get interest from young people equipped for the new global.

Background of Research. In 21st century life, Industrial Design (ID) education need to reinvent about everything to override challenge of public consciousness. Teaching innovation on learning viability among ID students is including logical advances, innovation forward leaps, new political, financial designs, ecological arrangements, or a refreshed code of morals for these days' life. Everything demands innovative, out of box thinking is a must in teaching and learning [6].

Teaching innovation for ID programme need strategies to initiate learners and lecturer into effective ways to help learners engage in different activities based on ideas about teaching and learning process. Different learning strategies may be used in each of the active learning designs [7]. To meet 21st century expectations in ID education, lecturers need to depart from the traditional ideas, pedagogies and need some changes to develop the sort of learning for ID students and their work futures. There are a number of ways that lecturers can use and provide students the tools and experiences with innovative mindset.

Objective. OECD [8] mentioned that design programmes are very common in many countries nowadays; creativity is increasingly important for lecturer teaching innovation for their professional success and that of their students, particularly given the learning effectiveness.

Teaching innovation should concentrate on encouraging development by setting interest, basic reasoning, profound comprehension, the guidelines and devices of request and imaginative conceptualizing at the focal point to the ID programme.

The objectives of this study are:

To study components of teaching innovation on learning effectiveness required in Industrial Design Programme.

To identify techniques and strategies for teaching innovation which provide Industrial Design students with a good outcome.

Meta-Analysis. Meta-analysis is a set of techniques used to combine statements from different journals, papers and articles into one report. In this article, meta-analysis combines information from multiple lecturers, scholars and researchers to increase the chances of finding valuable ideas.

In Table 1, eligibility, identifying studies, abstracting data are defined, and the results are discussed. The scope of analysis constitutes the study of teaching innovation for Industrial Design. This study acquired three sub-topics directly related to Industrial Design education. These three topics are: 1) A need for 21st century Industrial Design Education, 2) Teaching Innovation for Active Learning Strategies, 3) Teaching Innovation for Active Learning Ideas.

ISSN 1563-2415

All of these topics play important roles in guiding lecturers to conduct teaching innovation on learning effectiveness in higher education for Industrial Design programme.

Table 1: Important Issues of Teaching Innovation for Industrial Design Programme

Accredited Lecturers, Scholars of Researchers	A Need 21st Century Industrial Design Education	Teaching Innovation for Active Learning Strategies	Teaching Innovation for Active Learning Ideas
Reeves [9]	Lecturers need to examine their professional practice and their impact on student achievement in 21st century education		
Carrol et al. [10]	Design thinking is a power tool for learning comes in the ways it can support a diverse range of interdisciplinary academic content	Teaching lessons that use design thinking as leverage for learning can provide rich experiences that encourage the imposition of a full set of knowledge and skills	
Nilson [11]	Problem-based learning offers students the opportunity to develop skills		
Stuart [12]	Problem-based learning technique encourages knowledge construction among students		
Berkeley [13]		Multiple active learning strategies may be used in each of the active learning design. *Sit & talk with peers nearby, turn & talk, individual or group quizzed and jigsaws*	
Dove & Revilla [14]			From creating study plans and keeping engagement, to behavior records and communicating with students out of the classroom, mobile apps offer lecturers harness tech in place of combating it

ISSN 1563-2415

Glover [15]			Teaching through role play is a sufficient way to make students step out of their comfort zone and develop their interpersonal skills
Edsys [16]			Innovative ideas that will help lecturers mix into their teaching strategies: *"Real-World" Learning, Creative Teaching, Brainstorm, Audio & Video Tools, Classes Outside the Class-room, and Role Play*

Results and Discussion. All the information is focused on teaching innovation on learning effectiveness for Industrial Design programme and divided into three topics where more will be explained about the teaching innovation of Industrial Design programmes. The topics clarify the understanding of 21st century Industrial Design education need through teaching innovation strategies and ideas

A Need for 21st Century Industrial Design Education. Reeves [9] expressed that lecturer need to look at their expert practice and their impact on student accomplishment. In the spirit of student-centered responsibility, a 21st century education must consequently be attached to learning results and capability in both center subject information and 21st century abilities that are normal and profoundly esteemed in and beyond school. There are various ways that teachers can utilize and furnish students the instruments and encounters with innovative mindset.

Design Thinking to Optimize Student Learning

Design thinking is a way to deal with discovering that centers around building up design inventive certainty through involved tasks that emphasis on empathy, advancing a predisposition toward activity, empowering ideation and encouraging dynamic critical thinking. It is a power tool for learning comes in the manners it can uphold a diverse range of interdisciplinary academic content [10]. Teaching lessons that use design thinking as influence for learning can give rich encounters that encourage the imposition of a full arrangement of knowledge and skills.

Move from projects to Problem Based Learning

Most lecturers have done projects, but the majority do not use the defined set of methods associated with high-quality problem-based learning (PBL). Nilson [11] pointed that a well-design PBL project offers students the opportunity to develop skills related to concept interpretation, critical thinking and analysis. Stuart [12] claimed that PBL technique encourages knowledge construction among students, stimulating students to integrate design process into activities in reality.

Teaching Innovation for Active Learning Strategies. Different strategies may be used in active learning of Industrial Design programme, especially for teaching innovation

ISSN 1563-2415

[17]. Multiple active learning strategies may be used in each of the active learning designs. Here is the list of strategies:

Sit & talk with peers nearby

Disclose to design students that a think-pair-share permit them to initiate their earlier information and offer design thoughts regarding project. Design students get an opportunity to arrange their thoughts by utilizing this design. In this structure, students contemplate the project brief, the pair up with classmate to talk about their intuition, end up share their discussion with another group.

Turn and Talk

In a turn and talk, an inquiry concerning design problem is tossing to students and basically go to the individual close to them to examine. This can fill in as an agreeable route for students to impart their reasoning and thoughts to other people and set up for them to keep offering to the bigger group. lecturer doesn't have to hear every one of the substances shared, only the significant part of subject.

Individual or Group test

Give designs students a test that they complete exclusively and go in to be evaluated. Place students in a small group after the individual test and give a test once more. They will talk about the appropriate responses in their group and turn it in for a group score. Both tests are reviewed and if the group score is higher, the two evaluations are arrived at the midpoint of. The group score can't hurt somebody in the event that they have a higher individual score.

Jigsaws

Jigsaw conversation is a fun and dynamic group organization model that supports peer instructing and helpful learning. Design students work in small group to peruse project brief that has been coordinated into areas. Every student gets in the gathering to peruse one segment of the material furnished and afterward imparted the data to the remainder of their group. There are different changes of jigsaws, they read it separately and afterward talk about in their small group to ensure everybody in their group gets it [13].

Teaching Innovation for Active Learning Ideas. The challenge today for Industrial Design lecturer is the way to catch the students' attention and putting across thoughts so that it stays with them long after they have left the classroom. Edsys [16] listed some innovative ideas that will help lecturers mix into their showing strategies and make the class seriously fascinating.

"Real-World" Learning

Connect the lessons to real world learning. Share the real-world experiences with students to make teaching lessons fresh and interesting. Relating and demonstrating through real life situations, will make the theory easier to understand, students will get it very clear. For example, lecturers can make use of smart apps in class to make some sessions more fun and attractive. Dove & Revilla [14] stated that from creating study plans and keeping engagement, to behavior records and communicating with students out of the classroom, mobile apps offer lecturers harness tech in place of combating it. For example, Kahoot (Figure 1) let lecturers turn the class lesson into a gameshow. Lecturers have to do is enter the prepared questions and answers into the site to create an instantly playable game with a web browser. Then the students just download to join in on the fun.

ISSN 1563-2415

Figure 1. Kahoot (Source: Digital Trends)

Creative Teaching

Use creative tools to stimulate creativity, include playful games or forms of visual exercises that will excite the young minds and capture their interest. This is a good time to test student's capability and identify student's creative abilities and encourage creative contributions. Bring aspects of creativity into all your subjects, be it design process, design thinking and design project. Think of ways to develop their creative ideas. Encourage different ideas, give them freedom to explore.

Brainstorm

Set aside a few minutes for brainstorming sessions to generate new ideas into classrooms. These sessions are an extraordinary method to get the expressive energies pumping. Design students will get various thoughts if numerous minds zeroing in on one single though and will likewise include everybody in class get into the conversation. This is an incredible stage for students to voice out their considerations. Lecturer can set a few guidelines before the brainstorming session start.

Audio & Video Tools

Lecturers can fuse general media materials in teaching sessions. Utilize some information illustrations or psyche planning and mind planning apparatuses that will help students' creative mind flourish and develop. These strategies won't just build up their capacity to tune in yet will likewise assist them with understanding the ideas better. For instance, lecturer can get configuration project introduction materials, direct live online conversations or playback accounts of public instructors. There is a great deal of brilliant applications for amazing slideshow or introductions.

Classes Outside the Classroom

Some lessons are best realized, when students are taught outside of the classroom. Sort out field trips that are applicable to the lessons or essentially go for exploration outside of the classroom. Design students will track down this new and energizing; they will learn and recall the things instructed quicker. Lecturer just need to arrange depending on the age group, utilize this technique for certain exercises; ensure keep it sufficiently straightforward to catch their mind and attention.

Role Play

Instructing through role play is an adequate method to make design students venture out of their customary range of familiarity and build up their relational abilities. This strategy proves to be useful, particularly when showing design case study or current design trends. The pretending approach will assist the design students with seeing how the teaching material

will be applicable to their daily tasks. This is a procedure that permits students to investigate practical circumstances by cooperating with others in a managed way to create insight and preliminary various techniques in a supported environment [15].

Conclusion. Whether lecturers are facing a lecture hall filled with 100 students or a small class with 10 students, one of the primary goals for the class should be actively engage students with innovative methods. Industrial Design students learn more when they participate in the design process of active learning through teaching innovation, whether it is through discussion, practice, review, or application.

The topics discussed above focus mainly on the literature definition and an overview of Industrial Design teaching innovation, including strategies and ideas. It is important to have a full understanding of each topic and the relation between them. The objectives of research were achieved based on these findings. It is hoped that this research can help Industrial Design lecturers conduct the Industrial Design courses and improve the student learning effectiveness in higher education.

Acknowledgement. I am thankful to my family who encouraged me and prayed for me throughout the time of my research. I thank all who in one way or another contributed to the completion of this research.

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ӨНДІРІСТІК СТУДЕНТТЕРДІ ОҚУ ТИІМДІЛІГІНЕ ОҚУ ИННОВАЦИЯЛАРЫНЫҢ ӘСЕРІ ЖОҒАРЫ ОҚУ ОҚУЫНДАҒЫ ДИЗАЙН

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Аннотация: *Бұл мақалада өнеркәсіптік дизайндағы білім берудегі инновацияны оқытудың әсері талқыланады, қоғамдық сана сынынан өту үшін бәрін қайта ойлап табу қажет. Инновациялық білім ғылыми жетістіктерді, технологиялық жетістіктерді, жаңа саяси және экономикалық құрылымдарды, экологиялық шешімдерді немесе қазіргі өмірдің жаңартылған этика кодексін қамтиды. Барлығы жаңашыл, қордан тыс ойлауды талап етеді, оқыту мен оқу үшін қажет. Өнеркәсіптік дизайн бойынша білім берудің бүгінгі күні студенттердің назарын аудару және идеяларды олар сыныптан шыққаннан кейін ұзақ уақыт бойы сақтайтын етіп жеткізу болып табылады. Бұл өнеркәсіптік дизайн мұғалімдеріне инновацияның дамуына әсер ететін нұсқаулық инновациялар жиынтығы қажет екенін білдіреді. Сондықтан оқытудың тиімділігін оқытудағы жаңашылдық ретінде қарастырылатын элементтерді, идеяларды және әдістерді меңгеру үшін мазмұн зерттеледі. Бұл мақаланың мақсаты өнеркәсіптік дизайн бағдарламасында инновациялық оқыту әдістерінің әсерін анықтау және инновациялық оқыту процестерінің өнеркәсіптік дизайн бағдарламасында оқытудың тиімділігіне қалай әсер ететінін зерттеу болып табылады. Бұл мақала аккредиттелген ғалымдар мен зерттеушілерден тақырып бойынша қосымша деректерді жинайды; тақырып бойынша бар зерттеулерді сыни тұрғыдан қарастырады; және қарама-қарсы көзқарастар мен теориялық көзқарастарды талдайды. Осылайша, бұл мақалада өнеркәсіптік дизайндағы инновацияларды оқыту тұжырымдамасы және жоғары оқу орындарында өнеркәсіптік дизайн студенттерін оқытудың тиімділігі жинақталған.*

Түйін сөздер: *өнеркәсіптік дизайн бойынша білім, оқыту инновациялары, жоғары білім, оқытудың тиімділігі*.

ISSN 1563-2415

ВЛИЯНИЕ ОБУЧАЮЩИХ ИННОВАЦИЙ НА ЭФФЕКТИВНОСТЬ ОБУЧЕНИЯ СТУДЕНТОВ ПРОМЫШЛЕННЫХ ДИЗАЙН В ВЫСШЕМ ОБРАЗОВАНИИ

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Аннотация: *В этой статье обсуждается эффект обучения инновациям в образовании по промышленному дизайну, необходимо заново изобрести все, чтобы преодолеть вызов общественного сознания. Обучение инновациям включает в себя научные достижения, технологические прорывы, новые политические и экономические структуры, экологические решения или обновленный кодекс этики для современной жизни. Все требует инновационного, нестандартного мышления, необходимого в преподавании и обучении. Задача сегодня для образования в области промышленного дизайна состоит в том, как привлечь внимание студентов и донести идеи таким образом, чтобы они оставались с ними еще долго после того, как они покинут класс. Это означает, что преподавателям промышленного дизайна нужен набор учебных инноваций, влияющих на инновационное развитие. Таким образом, содержание исследует, чтобы усвоить элементы, идеи и методы, которые рассматриваются как инновации в обучении эффективности обучения. Цели этой статьи - определить влияние методов обучения инновациям в программе промышленного дизайна и изучить, как процессы обучения инновациям влияют на эффективность обучения в программе промышленного дизайна. В этой статье собраны вторичные данные по теме от аккредитованных ученых и исследователей; критически рассматривает существующие исследования по теме; и анализирует противоположные точки зрения и теоретические подходы. Таким образом, в этой статье консолидируется концепция обучения инновациям в области промышленного дизайна и эффективности обучения студентов, изучающих промышленный дизайн, в высших учебных заведениях.*

Ключевые слова: *образование в области промышленного дизайна, инновации в обучении, высшее образование, эффективность обучения.*

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